AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application:

LISTING OF CLAIMS:

1. (currently amended): A speech communication apparatus comprising:

a signal output transducer for receiving a distant signal from a far-end talker and producing acoustic energy of the distant signal;

a signal input transducer for producing a near-end signal which may contain a component representing a speech activity of a near-end talker or an acoustic echo component, or both, wherein said acoustic echo component occurs as a result of the distant signal being transmitted through an acoustic echo path from the signal output transducer to the signal input transducer;

an echo canceller <u>having a replica of a transfer function of said acoustic echo path</u> for producing an echo replica from <u>both of</u> said distant signal and from a residual echo representing a difference between said near-end signal and said echo replica; and

a spectral shaper for receiving one of said near-end signal and said residual echo as a first input signal, receiving said echo replica as a second input signal, estimating said acoustic echo component by modifying said second input signal, and shaping spectrum of said first input signal with the estimated acoustic echo component.

2. (original): The speech communication apparatus of claim 1, wherein said spectral shaper estimates said acoustic echo component for each of a plurality of subband frequencies of audio spectrum.

3. (original): The speech communication apparatus of claim 1, wherein said spectral shaper estimates said acoustic echo component from a ratio of said first input signal to said second input signal.

4. (original): The speech communication apparatus of claim 1, wherein said spectral shaper estimates said acoustic echo component from a ratio of said first input signal to said second input signal for each of a plurality of subband frequencies of audio spectrum.

5. (original): The speech communication apparatus of claim 1, wherein said spectral shaper comprises:

means for dividing said first input signal into a first set of subband frequency component signals;

means for dividing said second input signal into a second set of subband frequency component signals;

a plurality of subband spectral shaping means, each of the subband spectral shaping means receiving a corresponding one of the first set of subband frequency component signals as a first subband signal, receiving a corresponding one of the second set of subband frequency

component signals as a second subband signal, producing an estimate of a subband acoustic echo component from the first and second subband signals, and shaping the first subband signal with the estimate of the subband acoustic echo component; and

means for combining output signals of said plurality of subband spectral shaping means.

6. (original): The speech communication apparatus of claim 5, wherein each of said subband spectral shaping means comprises:

a division circuit for producing a ratio of said first subband signal to said second subband signal;

a smoother for smoothing said ratio when said speech activity is low or zero;

a multiplier for multiplying said second subband signal by said smoothed ratio to produce said estimate of the subband acoustic echo component; and

a subtractor for producing a difference signal representative of the difference between the first subband signal and said estimate supplied from said multiplier.

7. (previously presented): The speech communication apparatus of claim 6, wherein said smoother includes means for causing said smoothed ratio to vary sharply at a rising edge of a transition of said ratio and vary slowly at a falling edge of the transition.

8. (original): The speech communication apparatus of claim 6, wherein said division circuit includes first and second smoothers for smoothing said first and second subband signals, respectively, before said ratio is produced.

9. (previously presented): The speech communication apparatus of claim 8, wherein said first smoother includes means for causing said smoothed first subband signal to vary sharply at a rising edge of a transition of said first subband signal and vary slowly at a falling edge of the transition, and wherein said second smoother includes means for causing said smoothed second subband signal to vary sharply at a rising edge of a transition of said second subband signal and vary slowly at a falling edge of the transition.

10. (original): The speech communication apparatus of claim 5, wherein each of said subband spectral shaping means comprises:

a first division circuit for producing a first ratio of said first subband signal to said second subband signal;

a second division circuit for producing a second ratio of said second subband signal to said first subband signal;

a first smoother for smoothing said first ratio when said speech activity is low or zero;

a first multiplier for multiplying the smoothed first ratio by said second ratio;

a second smoother for smoothing the output of said first multiplier;

a subtractor for subtracting integer 1 from the output of the second smoother; and

a second multiplier for multiplying said first subband signal by the output of the subtractor.

11. (previously presented): The speech communication apparatus of claim 10, wherein said first smoother includes means for causing said smoothed first ratio to vary sharply at a rising edge of a transition of said first ratio and vary slowly at a falling edge of the transition.

12. (original): The speech communication apparatus of claim 10, wherein said first division circuit includes first and second smoothers for smoothing said first and second subband signals, respectively, before said first ratio is produced.

13. (original): The speech communication apparatus of claim 1, further comprising a harmonics generator for emphasizing harmonics components of said distant signal contained in said echo replica from said echo canceller.

14. (original): The speech communication apparatus of claim 1, wherein said echo canceller comprises:

means for dividing said residual echo into a first set of subband frequency component signals;

means for dividing said distant signal into a second set of subband frequency component signals;

an adaptive filter bank for adaptively filtering said second set of subband frequency component signals according to said first set of subband frequency component signals;

means for combining output signals of said adaptive filter bank to produce said echo replica; and

means for nullifying the first set of subband frequency component signals when said speech activity is high,

wherein said spectral shaper comprises:

a plurality of subband spectral shaping means, each of the subband spectral shaping means receiving a corresponding one of the first set of subband frequency component signals as a first subband signal, receiving a corresponding one of the output signals of said adaptive filter bank as a second subband signal, producing an estimate of a subband acoustic echo component from the first and second subband signals, and shaping the first subband signal with the estimate of the subband acoustic echo component; and

means for combining output signals of said plurality of subband spectral shaping means.

15. (original): The speech communication apparatus of claim 14, wherein each of said subband spectral shaping means comprises:

a division circuit for producing a ratio of said first subband signal to said second subband signal;

a smoother for smoothing said ratio when said speech activity is low or zero;

a multiplier for multiplying said second subband signal by said smoothed ratio to produce said estimate of the subband acoustic echo component; and

a subtractor for producing a difference signal representative of the difference between the first subband signal and said estimate supplied from said multiplier.

16. (previously presented): The speech communication apparatus of claim 15, wherein said smoother includes means for causing said smoothed ratio to vary sharply at a rising edge of a transition of said ratio and vary slowly at a falling edge of the transition.

17. (original): The speech communication apparatus of claim 15, wherein said division circuit includes first and second smoothers for smoothing said first and second subband signals, respectively, before said ratio is produced.

18. (previously presented): The speech communication apparatus of claim 17, wherein said first smoother includes means for causing said smoothed first subband signal to vary sharply at a rising edge of a transition of said first subband signal and vary slowly at a falling edge of the transition, and wherein said second smoother includes means for causing said smoothed second subband signal to vary sharply at a rising edge of a transition of said second subband signal and vary slowly at a falling edge of the transition.

19. (original): The speech communication apparatus of claim 14, wherein each of said subband spectral shaping means comprises:

a first division circuit for producing a first ratio of said first subband signal to said second subband signal;

a second division circuit for producing a second ratio of said second subband signal to said first subband signal;

a first smoother for smoothing said first ratio when said speech activity is low or zero;

a first multiplier for multiplying the smoothed first ratio by said second ratio;

a second smoother for smoothing the output of said first multiplier;

a subtractor for subtracting integer 1 from the output of the second smoother; and

a second multiplier for multiplying said first subband signal by the output of the subtractor.

20. (previously presented): The speech communication apparatus of claim 19, wherein said first smoother includes means for causing said smoothed first ratio to vary sharply at a rising edge of a transition of said first ratio and vary slowly at a falling edge of the transition.

21. (original): The speech communication apparatus of claim 19, wherein said first division circuit includes first and second smoothers for smoothing said first and second subband signals, respectively, before said first ratio is produced.

22. (previously presented): A speech communication apparatus comprising:

a signal output transducer for receiving a distant signal from a far-end talker and producing acoustic energy of the distant signal;

means for dividing said distant signal into a first set of subband frequency component signals;

a signal input transducer for producing a near-end signal which may contain a component representing a speech activity of a near-end talker or an acoustic echo component, or both, wherein said acoustic echo component occurs as a result of the distant signal being transmitted through an acoustic echo path from the signal output transducer to the signal input transducer;

means for dividing said near-end signal into a second set of subband frequency component signals;

a plurality of subband echo suppressors, each of the subband echo suppressors comprising:

an echo canceller for producing an echo replica from a corresponding one of said first set of subband frequency component signals and from a subband residual echo representing a difference between a corresponding one of said second set of subband frequency component signals and said echo replica; and

subband spectral shaping means for receiving one of said near-end signal and said subband residual echo as a first subband input signal, receiving said echo replica as a second subband input signal, estimating said acoustic echo component by modifying said second

subband input signal, and shaping said first subband input signal with the estimated acoustic echo component to produce an output signal of the subband echo suppressor, and

means for combining the output signals of said plurality of subband echo suppressors.

23. (previously presented): The speech communication apparatus of claim 22, wherein said subband spectral shaping means comprises:

a division circuit for producing a ratio of said first subband signal to said second subband signal;

a smoother for smoothing said ratio when said speech activity is low or zero;

a multiplier for multiplying said second subband input signal by said smoothed ratio to produce said estimated acoustic echo component; and

a subtractor for producing a difference signal representative of the difference between the first subband input signal and said estimated acoustic echo component supplied from said multiplier.

24. (previously presented): The speech communication apparatus of claim 23, wherein said smoother includes means for causing said smoothed ratio to vary sharply at a rising edge of a transition of said ratio and vary slowly at a falling edge of the transition.

25. (original): The speech communication apparatus of claim 23, wherein said division circuit includes first and second smoothers for smoothing said first and second subband signals, respectively, before said ratio is produced.

26. (previously presented): The speech communication apparatus of claim 25, wherein said first smoother includes means for causing said smoothed first subband signal to vary sharply at a rising edge of a transition of said first subband signal and vary slowly at a falling edge of the transition, and wherein said second smoother includes means for causing said smoothed second subband signal to vary sharply at a rising edge of a transition of said second subband signal and vary slowly at a falling edge of the transition.

27. (previously presented): The speech communication apparatus of claim 22, wherein said subband spectral shaping means comprises:

a first division circuit for producing a first ratio of said first subband signal to said second subband signal;

a second division circuit for producing a second ratio of said second subband signal to said first subband signal;

a first smoother for smoothing said first ratio when said speech activity is low or zero;

a first multiplier for multiplying the smoothed first ratio by said second ratio;

a second smoother for smoothing the output of said first multiplier;

a subtractor for subtracting integer 1 from the output of the second smoother; and

a second multiplier for multiplying said first subband signal by the output of the subtractor.

28. (previously presented): The speech communication apparatus of claim 27, wherein said first smoother includes means for causing said smoothed first ratio to vary sharply at a rising edge of a transition of said first ratio and vary slowly at a falling edge of the transition.

29. (original): The speech communication apparatus of claim 27, wherein said first division circuit includes first and second smoothers for smoothing said first and second subband signals, respectively, before said first ratio is produced.

30. (currently amended): A method of suppressing acoustic echo, comprising the steps of:

a) receiving a distant signal from a far-end talker and producing acoustic energy of the distant signal from a signal output transducer;

b) producing a near-end signal from a signal input transducer which may contain a component representing a speech activity of a near-end talker or an acoustic echo component, or both, wherein said acoustic echo component occurs as a result of the distant signal being transmitted through an acoustic echo path from the signal output transducer to the signal input transducer;

c) producing an echo replica from both of said distant signal and from a residual echo representing a difference between said near-end signal and said echo replica by using a replica of a transfer function of said acoustic echo path and by using the residual echo as a feedback signal to produce said echo replica; and

d) receiving one of said near-end signal and said residual echo as a first input signal, receiving said echo replica as a second input signal, and estimating said acoustic echo component by modifying said echo replica; and

e) shaping spectrum of said first input signal with the estimated acoustic echo component.

31. (original): The method of claim 30, wherein step (d) estimates said acoustic echo component for each of a plurality of subband frequencies of audio spectrum.

32. (original): The method of claim 30, wherein step (d) estimates said acoustic echo component from a ratio of said first input signal to said second input signal.

33. (original): The method of claim 30, wherein step (d) estimates said acoustic echo component from a ratio of said first input signal to said second input signal for each of a plurality of subband frequencies of audio spectrum.

34. (previously presented): The method of claim 30, wherein step (d) comprises:

d_1) dividing said first input signal into a first set of subband frequency component signals;

d_2) dividing said second input signal into a second set of subband frequency component signals;

d_3) receiving a corresponding one of the first set of subband frequency component signals as a first subband signal, receiving a corresponding one of the second set of subband frequency component signals as a second subband signal, producing said estimated acoustic echo component from the first and second subband signals, and shaping the first subband signal with the estimated acoustic echo component to produce an output signal;

d_4) repeating step (d_3) for all the subband frequency component signals of said first and second sets of subband frequency component signals to produce a plurality of said output signals; and

d_5) combining said plurality of said output signals.

35. (previously presented): The method of claim 34, wherein step (d_3) comprises:

producing a ratio of said first subband signal to said second subband signal;

smoothing said ratio when said speech activity is low or zero;

multiplying said second subband signal by said smoothed ratio to produce said estimate of the subband acoustic echo component; and

producing a difference signal representative of the difference between the first subband signal and said estimated acoustic echo component.

36. (previously presented): The method of claim 35, wherein the smoothing step causes said smoothed ratio to vary sharply at a rising edge of a transition of said ratio and vary slowly at a falling edge of the transition.

37. (original): The method of claim 35, wherein the ratio producing step includes the step of smoothing said first and second subband signals before said ratio is produced.

38. (previously presented): The method of claim 37, wherein the step of smoothing the first and second subband signals causes said smoothed first and second subband signals to vary sharply at a rising edge of a transition of the first and second subband signals and vary slowly at a falling edge of the transition.

39. (previously presented): The method of claim 34, wherein step (d_3) comprises:

D_1) producing a first ratio of said first subband signal to said second subband signal;

D_2) producing a second ratio of said second subband signal to said first subband signal;

D_3) smoothing said first ratio when said speech activity is low or zero;

D_4) multiplying the smoothed first ratio by said second ratio;

D_5) smoothing the multiplied smoothed first ratio;

D_6) subtracting integer 1 from the multiplied first ratio smoothed by step (D_5) to produce a subtracted signal; and

D_7) multiplying said first subband signal by said subtracted signal.

40. (previously presented): The method of claim 39, wherein step (D_3) includes the step of causing said smoothed first ratio to vary sharply at a rising edge of a transition of said first ratio and vary slowly at a falling edge of the transition.

41. (previously presented): The method of claim 39, wherein step (D_1) includes the steps of smoothing said first and second subband signals before said first ratio is produced.

42. (original): The method of claim 30, further comprising accentuating harmonics components of said distant signal contained in said echo replica before estimating said acoustic echo component.

43. (original): The method of claim 30, wherein step (c) comprises the steps of:

dividing said residual echo into a first set of subband frequency component signals;

dividing said distant signal into a second set of subband frequency component signals;

adaptively filtering said second set of subband frequency component signals according to said first set of subband frequency component signals;

combining the adaptively filtered signals to produce said echo replica; and

nullifying the first set of subband frequency component signals when said speech activity is high,

wherein step (d) comprises:

receiving a corresponding one of the first set of subband frequency component signals as a first subband signal, receiving a corresponding one of the adaptively filtered signals as a second subband signal, and producing an estimate of a subband acoustic echo component from the first and second subband signals;

shaping the first subband signal with the estimate of the subband acoustic echo component; and

combining a plurality of said shaped first subband signals.

44. (original): The method of claim 43, wherein the shaping step comprises:

producing a ratio of said first subband signal to said second subband signal;

smoothing said ratio when said speech activity is low or zero;

multiplying said second subband signal by said smoothed ratio to produce said estimate of the subband acoustic echo component; and

producing a difference signal representative of the difference between the first subband signal and said estimate of the subband acoustic echo component.

45. (previously presented): The method of claim 44, wherein the smoothing step causes said smoothed ratio to vary sharply at a rising edge of a transition of said ratio and vary slowly at a falling edge of the transition.

46. (original): The method of claim 44, wherein the ratio producing step comprises the steps of smoothing said first and second subband signals before said ratio is produced.

47. (previously presented): The method of claim 46, wherein the steps of smoothing the first and second subband signals cause said smoothed first and second subband signals to vary sharply at a rising edge of a transition of the first and second subband signals and vary slowly at a falling edge of the transition.

48. (original): The method of claim 43, wherein the shaping step comprises:

d_1) producing a first ratio of said first subband signal to said second subband signal;

d_2) producing a second ratio of said second subband signal to said first subband signal;

d_3) smoothing said first ratio when said speech activity is low or zero;

d_4) multiplying the smoothed first ratio by said second ratio;

d_5) smoothing the multiplied smoothed first ratio;

d_6) subtracting integer 1 from the first ratio smoothed by step (d_5) to produce a subtracted signal; and

d_7) multiplying said first subband signal by said subtracted signal.

49. (previously presented): The method of claim 48, wherein step (d_3) includes the step of causing said smoothed first ratio to vary sharply at a rising edge of a transition of said first ratio and vary slowly at a falling edge of the transition.

50. (original): The method of claim 48, wherein step (d_1) includes the steps of smoothing said first and second subband signals before said first ratio is produced.

51. (previously presented): A method of suppressing acoustic echo, comprising the steps of:

a) receiving a distant signal from a far-end talker and producing acoustic energy of the distant signal from a signal output transducer;

b) dividing said distant signal into a first set of subband frequency component signals;

c) producing a near-end signal by a signal input transducer, wherein the near-end signal may contain a component representing a speech activity of a near-end talker or an acoustic echo component, or both, wherein said acoustic echo component occurs as a result of the distant signal being transmitted through an acoustic echo path from the signal output transducer to the signal input transducer;

d) dividing said near-end signal into a second set of subband frequency component signals;

e) producing an echo replica from a corresponding one of said first set of subband frequency component signals and from a subband residual echo representing a difference between a corresponding one of said second set of subband frequency component signals and said echo replica and using said subband residual echo as a feedback signal to produce said echo replica;

f) receiving one of said subband residual echo and said near-end signal as a first subband input signal, receiving said echo replica as a second subband input signal, and estimating said acoustic echo component by modifying said second subband input signal;

g) shaping said first subband input signal with the estimated acoustic echo component to produce an output signal;

h) repeating steps (e) to (g) for all the subband frequency component signals of said first and second sets of subband frequency component signals to produce a plurality of said output signals; and

i) combining said plurality of said output signals.

52. (previously presented): The method of claim 51, wherein step (g) comprises the steps of:

producing a ratio of said first subband signal to said second subband signal;

smoothing said ratio when said speech activity is low or zero;

multiplying said second subband signal by said smoothed ratio to produce said estimated acoustic echo component; and

producing a difference signal representative of the difference between the first subband signal and said estimated acoustic echo component.

53. (previously presented): The method of claim 52, wherein the smoothing step causes said smoothed ratio to vary sharply at a rising edge of a transition of said ratio and vary slowly at a falling edge of the transition.

54. (original): The method of claim 52, wherein the ratio producing step includes the steps of smoothing said first and second subband signals before said ratio is produced.

55. (previously presented): The method of claim 54, wherein the steps of smoothing said first and second subband signals cause said smoothed first and second subband signals to vary sharply at a rising edge of a transition of said first and second subband signals and vary slowly at a falling edge of the transition.

56. (previously presented): The method of claim 51, wherein step (g) comprises the steps of:

g_1) producing a first ratio of said first subband signal to said second subband signal;

g_2) producing a second ratio of said second subband signal to said first subband signal;

g_3) smoothing said first ratio when said speech activity is low or zero;

g_4) multiplying the smoothed first ratio by said second ratio;

g_5) smoothing the multiplied smoothed first ratio;

g_6) subtracting integer 1 from the first ratio smoothed by step (g_5) to produce a subtracted signal; and

g_7) multiplying said first subband signal by said subtracted signal.

57. (previously presented): The method of claim 56, wherein step (g_3) causes said smoothed first ratio to vary sharply at a rising edge of a transition of said first ratio and vary slowly at a falling edge of the transition.

58. (previously presented): The method of claim 56, wherein step (g_1) includes the steps of smoothing said first and second subband signals before said first ratio is produced.

59. (currently amended): A spectral shaper for cancellation of noise comprising:

means for dividing a first input signal into a first set of subband frequency component signals;

means for dividing a second input signal into a second set of subband frequency component signals;

a plurality of subband spectral shaping means, each of the subband spectral shaping means receiving a corresponding one of the first set of subband frequency component signals as a first subband signal, receiving a corresponding one of the second set of subband frequency component signals as a second subband signal, estimating a subband noise component by modifying said second subband signal, and shaping the first subband signal with the estimated subband noise component; and

means for combining output signals of said plurality of subband spectral shaping means.

60. (previously presented): The spectral shaper of claim 59, wherein each of said subband spectral shaping means comprises:

a division circuit for producing a ratio of said first subband signal to said second subband signal;

a smoother for smoothing said ratio when said first input signal is indicative of low or zero speech activity;

a multiplier for multiplying said second subband signal by said smoothed ratio to produce said estimated subband noise component; and

a subtractor for producing a difference signal representative of the difference between the first subband signal and said estimated subband noise component supplied from said multiplier.

61. (previously presented): The spectral shaper of claim 60, wherein said smoother includes means for causing said smoothed ratio to vary sharply at a rising edge of a transition of said ratio and vary slowly at a falling edge of the transition.

62. (original): The spectral shaper of claim 60, wherein said division circuit includes first and second smoothers for smoothing said first and second subband signals, respectively, before said ratio is produced.

63. (previously presented): The spectral shaper of claim 62, wherein said first smoother includes means for causing said smoothed first subband signal to vary sharply at a rising edge of a transition of said first subband signal and vary slowly at a falling edge of the transition, and wherein said second smoother includes means for causing said smoothed second subband signal to vary sharply at a rising edge of a transition of said second subband signal and vary slowly at a falling edge of the transition.

64. (original): The spectral shaper of claim 59, wherein each of said subband spectral shaping means comprises:

a first division circuit for producing a first ratio of said first subband signal to said second subband signal;

a second division circuit for producing a second ratio of said second subband signal to said first subband signal;

a first smoother for smoothing said first ratio when said first input signal is indicative of low or zero speech activity;

a first multiplier for multiplying the smoothed first ratio by said second ratio;

a second smoother for smoothing the output of said first multiplier;

a subtractor for subtracting integer 1 from the output of the second smoother; and

a second multiplier for multiplying said first subband signal by the output of the subtractor.

65. (previously presented): The spectral shaper of claim 64, wherein said first smoother includes means for causing said smoothed first ratio to vary sharply at a rising edge of a transition of said first ratio and vary slowly at a falling edge of the transition.

66. (original): The spectral shaper of claim 64, wherein said first division circuit includes first and second smoothers for smoothing said first and second subband signals, respectively, before said first ratio is produced.

67. (previously presented): The speech communication apparatus of claim 1, wherein said spectral shaper estimates said acoustic echo component by modifying the magnitude of said second input signal.

68. (previously presented): The speech communication apparatus of claim 67, wherein said spectral shaper modifies the magnitude of said second input signal at a rate determined based on one of said first and second input signals.

69. (previously presented): The speech communication apparatus of claim 68, wherein said spectral shaper determines said rate when said speech activity is low or zero.

70. (previously presented): The speech communication apparatus of claim 1, wherein said spectral shaper shapes said spectrum by subtracting the estimated acoustic component from said first input signal.

71. (previously presented): The speech communication apparatus of claim 22, wherein said subband spectral shaping means estimates said acoustic echo component by modifying the magnitude of said second input signal.

72. (previously presented): The speech communication apparatus of claim 71, wherein said subband spectral shaping means modifies the magnitude of said second input signal at a rate determined based on one of said first and second input signals.

73. (previously presented): The speech communication apparatus of claim 72, wherein said subband spectral shaping means determines said rate when said speech activity is low or zero.

74. (previously presented): The speech communication apparatus of claim 22, wherein said subband spectral shaping means shapes said spectrum by subtracting the estimated acoustic component from said first input signal.

75. (previously presented): The method of claim 30, wherein step (d) comprises estimating said acoustic echo component by modifying the magnitude of said second input signal.

76. (previously presented): The method of claim 75, wherein step (d) comprises modifying the magnitude of said second input signal at a rate determined based on one of said first and second input signals.

77. (previously presented): The method of claim 76, wherein step (d) comprises determining said rate when said speech activity is low or zero.

78. (previously presented): The method of claim 30, wherein step (e) comprises shaping said spectrum by subtracting the estimated acoustic component from said first input signal.

79. (previously presented): The spectral shaper of claim 59, wherein each of said subband spectral shaping means estimates said subband noise component by modifying the magnitude of said second subband signal.

80. (previously presented): The spectral shaper of claim 79, wherein each of said subband spectral shaping means modifies the magnitude of said second subband signal at a rate determined based on one of said first and second subband signals.

81. (previously presented): The spectral shaper of claim 80, wherein each of said subband spectral shaping means determines said rate when said speech activity is low or zero.

82. (previously presented): The spectral shaper of claim 59, wherein each of said subband spectral shaping means shapes said spectrum by subtracting the estimated subband noise component from said first subband signal.